

From boatanchors@theporch.com Wed Jan 18 20:30:37 1995
Date: Wed, 18 Jan 1995 18:01:39 -0600
Message-Id: <2F1D894E@admin.ClemsonSC.ATTGIS.COM>
From: "Skelton, Tom" <TSkelton@engineer.clemsonsc.ATTGIS.COM>
Subject: Re: "Hot Water"

Matter of fact, if you ever saw a Yaesu FT201 (not many were imported into the USA), it REALLU does at a distance give an illusion of an S Line.

73, Tom WB4iUX

Tom.Skelton@ClemsonSC.NCR.COM

(if that fails: Tom.Skelton@ClemsonSC.ATTGIS.COM)

>From: boatanchors
>To: Multiple recipients of list
>Subject: Re: "Hot Water"
>Date: Sunday, January 15, 1995 5:36PM

In message <199501150253.AA22673@cameron.geom.umn.edu> penson@geom.umn.edu writes:

>
> Am just wondering if anyone knows the origin of "Hot Water" as in
> Hot Water 100, and other Heath "HW" series rigs.
>
> Chuck
>
>

--

I was just on the phone with my buddy K5LLK and he said that the reason they were called "Hot Water's" were from Benton Harbor, Harbor on the Water or HW.....

I don't know how accurate this is, but, Bill's the one who told me about his conversation with Hasagawa leading to the style of the FT101 series looking like Jap Collins gear.....and still Hasagawa didn't give Bill an equipment discount that Bill couldn't beat at Akehabara (Tokyo's electronic market)!!!

Rick Blank, KI5SL
ki5sl@sat.ampr.org
2223 Blanco Road
San Antonio, Texas 78212
end

From boatanchors@theporch.com Wed Jan 18 17:04:13 1995
Date: Wed, 18 Jan 1995 14:07:46 -0600
Message-Id: <Pine.SUN.3.91.950118135104.16358B-1000000@eiger.ceet.niu.edu>
From: Steve Berg <berg@eiger.ceet.niu.edu>
Subject: 6AG7 parameters?

Does anyone have proper class ab1 operating specifications for the 6AG7 tube? I am re-furbishing my Central Electronics 10A and want to properly bias the final amplifier.

Thanks,

Steve WA9JML

From boatanchors@theporch.com Wed Jan 18 15:41:37 1995
Date: Wed, 18 Jan 1995 12:46:00 -0600
Message-Id: <m0rUes9-000805C@aupair.cs.athabascau.ca>
From: tech@cs.athabascau.ca (Richard Loken)
Subject: re: 807 ratings

CCS: Continuous Commercial Service
ICAS: Intermittant Commercial & Amateur Service

Those rating from the 1938 book (if they are DC input to the plate) would be CCS ratings. I haven't seen any military gear that ever ran anything close to the ICAS ratings.

Gee, I guess the KWM2 runs pretty hot so I take that back...

Richard Loken VE6BSV, Systems Programmer - VMS : "...underneath those
Athabasca University : tuques we wear, our heads
Athabasca, Alberta Canada : are naked!"
** tech@cs.athabascau.ca ** : - Aurthor Black

From boatanchors@theporch.com Wed Jan 18 19:52:02 1995
Date: Wed, 18 Jan 1995 15:52:37 -0600
Message-Id: <01HLZZ2GZSNMHW9Y0H@ACAD.FANDM.EDU>
From: CCS_MAH@ADMIN.FANDM.EDU (Mark Hemlick Ph. D.)
Subject: Re: 807 ratings

Hi to all.

Bob and Richard replied about the 807 ratings in the 1938 manual.

Richard wrote:

>CCS: Continuous Commercial Service

>ICAS: Intermittant Commercial & Amateur Service

>

>Those rating from the 1938 book (if they are DC input to the plate)

>would be CCS ratings. I haven't seen any military gear that ever ran anything

>close to the ICAS ratings.

The manual is a bit unclear about which ratings refer to which type of duty cycle (i.e. intermittent, continuous, amateur, commercial). However, for most tube types, the manual lists three sets of values for "typical operation" for each tube application. The values I reported earlier listed the highest plate voltage and current ratings. These would probably correspond to an intermittent, amateur type level of service. I reported them so they could be compared with Bob's voltage recommendations, which were a bit higher. My understanding is that ratings for continuous commercial service would be lower. Here are the values for all three levels of service:

807 tube as RF power amplifier and oscillator- class C telegraphy.

Plate voltage:	400	500	600
Plate current:	95	95	100
Drive power	0.18	0.14	0.22
Power output:	25	30	37.5

Manual notes that output values are approximate and that efficiency can be as high as 75%. BTW, this little manual has many hints about design, use and installation of tubes. Has a few circuit diagrams too. The intro to the 807 expresses great pride in the tube, RCA saw it as a very advanced design at the time.

73 Mark KA3LFG

From boatanchors@theporch.com Wed Jan 18 21:00:12 1995

Date: Wed, 18 Jan 1995 18:17:33 -0600

Message-Id: <m0rUKYp-000bqBC@aupair.cs.athabascau.ca>

From: tech@cs.athabascau.ca (Richard Loken)

Subject: 807 ratings

Mark KA3LFG says:

>807 tube as RF power amplifier and oscillator- class C telegraphy.

>Plate voltage:	400	500	600
>Plate current:	95	95	100
>Drive power	0.18	0.14	0.22
>Power output:	25	30	37.5

>Manual notes that output values are approximate and that efficiency can be
>as high as 75%. BTW, this little manual has many hints about design, use

Ah! We are talking RF power out here and that is a horse of a different
colour!

At 50% efficiency the third example is running 75W DC which is pretty
reasonable for an ICAS rated class C 807 amplifier. The other two look like
CCS recommendations. Perhaps the terms ICAS and CCS had not yet been invented.

While we are on the subject, the tube is rated for power dissipated in the
plate and the screen as well as maximum voltages and currents which will in
the end give a ruling on DC power input and thus RF (or AF to the esoteric
audiophile) output.

My 1971 Radio Amateur's Handbook (which happens to be at work) sez:

807, 807W, 5933, 1625

Maximum Ratings:

Plate Dissipation:	30W	Screen Dissipation:	3.5W
Plate Voltage:	750V	Screen Voltage:	300V

Typical Operation

	PLATE	SCREEN	GRID	OUTPUT	
C-T	750V 100mA	250V	6mA	-45V 3.5mA	
	50W CW				
C-P	600	100	275	6.5	-90 4 42.5 Phone
AB1	750	15/70	275	3/8	-35 72 two tubes?
B	750	15/240	0		120 two tubes

A quick calculation yields:

	DC PLATE INPUT	DC SCREEN INPUT	PLATE DISSIPATION DC PWR - RF?
C-T	75W	15W	25W
C-P	60	17.8	17.5
AB1	11.5/52.5	8.3/22	??????????
B	11.5/180		60

The class AB1 numbers suggest that they couldn't decide whether to talk about
two tubes or one. The 6146 numbers are more like the class B numbers.

Considering the source and the results, the 1971 RAH is talking ICAS.

Why am I doing this? I am supposed to be debugging a Unix SCSI driver problem

wherein I cannot read/write ANSI tapes on a 9 track tape drive and I'm driving myself crazy.

Richard Loken VE6BSV, Systems Programmer - VMS : "...underneath those
Athabasca University : tuques we wear, our heads
Athabasca, Alberta Canada : are naked!"
** tech@cs.athabascau.ca ** : - Aurthor Black

From boatanchors@theporch.com Wed Jan 18 11:59:20 1995
Date: Wed, 18 Jan 1995 09:28:07 -0600
Message-Id: <199501181527.KAA36329@ee.duke.edu>
From: "Rhett T. George" <rtg@ee.duke.edu>
Subject: <didn't bother with a subject>

- Greetings -
The soft glow of functional vacuum tubes is hard to beat and is comforting. Last night a creeping form of non-funtionality came to visit me again. Let me describe it in case you receive a similar visitor.
A piece of the cathode coating has fractured and is stuck to the grid. It may at some temperatures develop a short between cathode and grid. The symptoms are that at 85 V on the input line, the grid voltage is 1 -3 V more positive than the other end of the grid bias resistor. At 90 V this rises to 5 V or so. On 100 V the grid voltage heads for 20 - 30 V. The emissive coating, now attach to the grid, is emitting electrons which is a negative current flowing from the grid into vacuum tube space, headed for the plate. This current is equivalent to a positive current flowing from that space to the grid, thence through the grid resistor to ground, causing a positive drop from grid to ground through said resistor.
Reckon I'll try the old TV trick of full heater voltage and some negative on the grid to see if the coating will dislodge.
By the way, this has happened in an 807 in an RCA audio amp (theatre amp).

Rhett George - KE4HIH

From boatanchors@theporch.com Wed Jan 18 16:59:44 1995
Date: Wed, 18 Jan 1995 13:36:23 -0600
Message-Id: <9501181939.AA27923@sumter.awod.com>
From: wb4ijn@awod.com (Steve Thomason)
Subject: <didn't bother with a subject>

"PRE-ESTATE SALE" e.g., if I don't get some of these radios out of the Living Room, the XYL will be holding an estate sale!

In listing these fine old vintage items for sale, I am going to hold a "reverse auction," e.g., each week the price will go down

until the unit is sold, unless I truly decide I can't live without it. Some are in operating positions now, some I have removed from service and replaced with more recently acquired playtoys, some I haven't even gotten around to playing with yet, and some I bought to use as "parts" units.

I have decided to limit my collection to Drake, Collins, Hammurland, and a few Johnson pieces. Everything else must go.

I need the following Hammurland items to "complete" my collection, and would be happy to work some sort of trade with you, or buy them from you if you prefer:

HAMMURLAND: SP200, HQ145X. Matching speakers for SP200, SP400 and HQ120.

OK, Here is the list as of January 18, 1995:

COLLINS R-390, very good cosmetics, excellent electrical, recently removed from service. When acquired a few months ago, I tested all tubes and replaced several weak ones. New AC power cord. Also seem to remember aligning this one. Original meters. \$350.

DRAKE W4 WATTMETER: This one has the copper-plated chassis. Perfect find for the Drake connoisseur who has the earlier Drake units. \$60.

DRAKE W4 WATTMETER: This one has the aluminum chassis like the TR4C's and C-lines. \$60.

DRAKE LOWPASS FILTER: This is "new in the box" and has the copper-plated chassis. \$60.

GONSET GSB100 TRANSMITTER: VERY Excellent cosmetics, excellent electrical. Has to be one of the prettiest transmitters ever made. SSB, CW, 100% AM modulation. Recently removed from service. \$195.

GONSET GSB101 LINEAR AMPLIFIER: Very good cosmetics, excellent electrical. Has had the high voltage transformer replaced. Original front panel (seems like people liked to drill holes in the 101's and mount all kinds of switches for some reason). Perfect match for the GSB100. Uses four 811A's. \$275.

HALLICRAFTERS SR2000 HURRICANE AND MATCHING POWER SUPPLY: very good to excellent cosmetics, excellent electrical, recently

removed from service. Prior to my acquiring this, it had been sent out for a complete alignment and new 8122 tubes. I think I still have the original bill; it came to over \$400. I replaced all electrolytics. I did not have enough 220 outlets when I had her set up, so I ran it off of 120. Power output on high tap around 1200, low tap around 600 or so if I remember right. \$895.

HALLICRAFTERS FPM300: Very good cosmetics, excellent electrical, I aligned it, used it for a while, and removed it from service. I seem to remember that the cabinet has some scratches, but the face does not. I have both the AC and the DC power cable. I don't remember if it has the optional fan on it. I think this was Hallicrafters first hybrid transceiver. I looked a long time before I found this one. \$350.

HALLICRAFTERS HT32B TRANSMITTER: Very good cosmetics, I only checked it out on 80 meters and it seemed to work fine. I don't remember if I changed the electrolytics or not. Bought it to go with my SX115, but sold the 115. This unit is now an orphan. I already have a spare to go with my SX101A, HT32A and HT33B. \$195.

HALLICRAFTERS HT37 TRANSMITTER: Excellent cosmetics, excellent electrical. I seem to remember that one knob has a chip out of it. The cabinet has been professionally repainted and looks great. This is the only transmitter I ever bought that I didn't have to do anything to. \$195.

HALLICRAFTERS SX-28 OR 28A: A fellow had these for sale as a package. One had the cabinet, so I bought both units so that I could get the cabinet to use with my other SX28A. One unit has the original transformer missing. Cosmetic condition on both is rough but restorable. (I wouldn't have the patience to do it, however). I'd classify these as parts units unless you are really into cosmetic as well as electrical restoration. There are no drilled holes or dents or anything, just a real neglected piece of equipment. \$50 no transformer, \$60 with transformer.

HAMMURLAND HQ170'S: I have several HQ170's, 170A's, some with clocks, some without. I'm keeping one and selling the rest. If it has a clock, add \$25. HQ170 - \$175. HQ170A - \$195.

HAMMURLAND HX50 TRANSMITTER: VERY excellent cosmetics, excellent electrical. Removed from service to make room for more Collins black boxes. One of the prettiest transmitters ever made. \$195.

HAMMURLAND HXL1 LINEAR AMPLIFIER: Excellent cosmetics, has a replacement meter and one knob is chipped. Excellent electrical.

Perfect match for the HX50 transmitter. \$295.

HEATH SB610 MONITOR SCOPE: Near mint cosmetics. I bought it from the original builder who was an engineer. Some of the chrome knob inserts have fallen off and I haven't gotten around to gluing them back on; I hope I can find them. \$95.

HEATH SB630 STATION CONSOLE, WATTMETER, CLOCK, PHONE PATCH: Near mint cosmetics. I bought it from the original builder who was an engineer. Some of the chrome knob inserts have fallen off and I haven't gotten around to gluing them back on; I hope I can find them. \$85.

JOHNSON PACEMAKER: Good cosmetics, unknown electrical. I had another one of these and was sorry I sold it, so I bought this one! I haven't even had a chance to take it out of its cabinet. I remember that there are scratches on the right side of the cabinet and a small dent on the lower right corner, but I don't think it shows from the front. I got \$425 for the one I had previously, but I had aligned it, etc. \$295.

JOHNSON INVADER 2000 AND POWER SUPPLY: VERY Excellent cosmetics, unknown electrical. I had two before this one, ended up trading them, and this one is the prettiest yet. Just don't have any place for it. Johnson rates it for 2000PEP sideband input, 1000W CW input, and 800W AM Linear input, if memory serves correctly. There were only 386 of these units made. Has separate power supply, of course. \$895.

JOHNSON VIKING II: Very good cosmetics, excellent electrical, recently removed from service to make room for a Collins 32V-1. \$195.

JOHNSON VIKING THUNDERBOLT LINEAR AMPLIFIER: Very, very good cosmetics, unknown electrical. Recently acquired in a moment of weakness! Intended to pair up with one of my Rangers, but no place for it now with the Desk Kilowatt living where it does. I am sure it needs new electrolytics. Bought it from a ham who got it from the original owner who said it was working FB when he last used it. Of course, I have heard that before! Has the hard to find 220 connector, but I cut the cord off because it was frayed. \$475.

NATIONAL NC300: Very good to excellent cosmetics. I can't remember if I changed the electrolytics in this one or not. Thought I wanted to collect National's until I found out how hard it was to find some. Gave up about the same time that I ran out of room. \$195.

I'm going to advertise also in Amateur Radio Trader, Electric Radio and QST so look there in case I have forgotten to list some items.

Pick-up is encouraged, but I will ship if you will pay the actual UPS shipping charges. I will buy the boxes, bubble wrap, peanuts, tape, etc.

You can reach me on packet WB4IJN@N4CII, or Internet wb4ijn@awod.com, or call 803-871-7749. 73, Steve.

From boatanchors@theporch.com Wed Jan 18 18:14:29 1995
Date: Wed, 18 Jan 1995 15:46:31 -0600
Message-Id: <199501182146.QAA115913@ee.duke.edu>
From: "Rhett T. George" <rtg@ee.duke.edu>
Subject: <didn't bother with a subject>

- Greetings -

Several folk have asked me about the cathode interface resistance. Here is a reference.

Bartley & White, "Characteristic Shifts in Oxide Cathode Tubes,"
A.I.E.E. Transactions. v 71, part 1, January, 1952. pp 43-49.

There are ten reference included.

Rhett George - KE4HIH

From boatanchors@theporch.com Wed Jan 18 18:23:20 1995
Date: Wed, 18 Jan 1995 15:28:20 -0600
Message-Id: <Pine.SUN.3.91.950118160557.6572A-1000000@access3.digex.net>
From: Tony Stalls <rstalls@access.digex.net>
Subject: Another Parts Source

ELECTRONICS PLUS
10302 Southard Drive
Beltsville, MD 20705
301-937-9009 and 800-591-9009

This is a long established surplus electronics dealer. Like most parts places these days, he has mostly computer stuff, but he does have other items that are of interest to BA'ers. I have been doing business with them since about 1975 and I have nothing but good things to say.

Tubes:

All kinds of tubes including Eimac and some antique types. He made a point of saying that he does not stock Russian tubes. Only American

types.

Shaft hardware:

Flex couplings, 3/8, 5/8, and 1/4 inch adapters, insulated couplings, 1/4 inch extensions, U-joints, etc.

Insulators:

Good assortment of stand-offs, feed throughs, etc.

Knobs:

They have a large assortment of knobs, including Raytheon types, and other miscellaneous types. He has several new National HRO main tuning knobs and the small (about 1-1/2" dia) light grey National main tuning knobs that have the reflective insert that are similar to the ones on the NC-98.

Mike connectors:

All kinds including both the chassis female and male two conductor types used on the Viking transmitter. (These are new in original wrapping. Chassis connectors \$2, cable by Cannon \$3.)

They also had the Noval plugs I've been looking everywhere for, but don't call and ask for them. I now have all five that he had in stock.

There were also four "mystery transformers" that were about 10-15 pounds with lots of leads that looked like they might have been TV transformers or whatever for \$26 each. I'll check them out a little better on the next visit.

No catalogs, but it's OK to call the 800 number for wants.

73,

Tony
K4KY0

From boatanchors@theporch.com Wed Jan 18 19:09:48 1995
Date: Wed, 18 Jan 1995 16:08:27 -0600
Message-Id: <9501182212.AA00385@sumter.awod.com>
From: wb4ijn@awod.com (Steve Thomason)
Subject: BOATANCHORS FOR SALE - UPDATE

"PRE-ESTATE SALE" e.g., if I don't get some of these radios out of the Living Room, the XYL will be holding an estate sale!

In listing these fine old vintage items for sale, I am going to hold a "reverse auction," e.g., each week the price will go down until the unit is sold, unless I truly decide I can't live without it. Some are in operating positions now, some I have removed from service and replaced with more recently acquired playtoys, some I haven't even gotten around to playing with yet, and some I bought to use as "parts" units.

I have decided to limit my collection to Drake, Collins, Hammurland, and a few Johnson pieces. Everything else must go.

I need the following Hammurland items to "complete" my collection, and would be happy to work some sort of trade with you, or buy them from you if you prefer:

HAMMURLAND: SP200, HQ145X. Matching speakers for SP200, SP400 and HQ120.

OK, Here is the list as of January 18, 1995:

(Items sold since last update: Drake wattmeters, HT32B, one of the SX28's)

COLLINS R-390, very good cosmetics, excellent electrical, recently removed from service. When acquired a few months ago, I tested all tubes and replaced several weak ones. New AC power cord. Also seem to remember aligning this one. Original meters. \$350.

DRAKE LOWPASS FILTER: This is "new in the box" and has the copper-plated chassis. \$60.

GONSET GSB100 TRANSMITTER: VERY Excellent cosmetics, excellent electrical. Has to be one of the prettiest transmitters ever made. SSB, CW, 100% AM modulation. Recently removed from service. \$195.

GONSET GSB101 LINEAR AMPLIFIER: Very good cosmetics, excellent electrical. Has had the high voltage transformer replaced. Original front panel (seems like people liked to drill holes in the 101's and mount all kinds of switches for some reason). Perfect match for the GSB100. Uses four 811A's. \$275.

HALLICRAFTERS SR2000 HURRICANE AND MATCHING POWER SUPPLY: very good to excellent cosmetics, excellent electrical, recently

removed from service. Prior to my acquiring this, it had been sent out for a complete alignment and new 8122 tubes. I think I still have the original bill; it came to over \$400. I replaced all electrolytics. I did not have enough 220 outlets when I had her set up, so I ran it off of 120. Power output on high tap around 1200, low tap around 600 or so if I remember right. \$895.

HALLICRAFTERS FPM300: Very good cosmetics, excellent electrical, I aligned it, used it for a while, and removed it from service. I seem to remember that the cabinet has some scratches, but the face does not. I have both the AC and the DC power cable. I don't remember if it has the optional fan on it. I think this was Hallicrafters first hybrid transceiver. I looked a long time before I found this one. \$350.

HALLICRAFTERS HT37 TRANSMITTER: Excellent cosmetics, excellent electrical. I seem to remember that one knob has a chip out of it. The cabinet has been professionally repainted and looks great. This is the only transmitter I ever bought that I didn't have to do anything to. \$195.

HALLICRAFTERS SX-28 OR 28A (I can't tell the difference): A fellow had a couple of these for sale as a package. One had the cabinet, so I bought both units so that I could get the cabinet to use with my other SX28A. The unit I have left has the power transformer missing. Cosmetic condition is rough but restorable. (I wouldn't have the patience to do it, however). I'd classify this as a parts unit unless you are really into cosmetic as well as electrical restoration. There are no drilled holes or dents or anything, just a real neglected piece of equipment. \$50 .

HAMMURLAND HQ170'S: I have several HQ170's, 170A's, some with clocks, some without. I'm keeping one and selling the rest. If it has a clock, add \$25. HQ170 - \$175. HQ170A - \$195.

HAMMURLAND HX50 TRANSMITTER: VERY excellent cosmetics, excellent electrical. Removed from service to make room for more Collins black boxes. One of the prettiest transmitters ever made. \$195.

HAMMURLAND HXL1 LINEAR AMPLIFIER: Excellent cosmetics, has a replacement meter and one knob is chipped. Excellent electrical. Perfect match for the HX50 transmitter. \$295.

HEATH SB610 MONITOR SCOPE: Near mint cosmetics. I bought it from the original builder who was an engineer. Some of the

chrome knob inserts have fallen off and I haven't gotten around to gluing them back on; I hope I can find them. \$95.

HEATH SB630 STATION CONSOLE, WATTMETER, CLOCK, PHONE PATCH:
Near mint cosmetics. I bought it from the original builder who was an engineer. Some of the chrome knob inserts have fallen off and I haven't gotten around to gluing them back on; I hope I can find them. \$85.

JOHNSON PACEMAKER: Good cosmetics, unknown electrical. I had another one of these and was sorry I sold it, so I bought this one! I haven't even had a chance to take it out of its cabinet. I remember that there are scratches on the right side of the cabinet and a small dent on the lower right corner, but I don't think it shows from the front. I got \$425 for the one I had previously, but I had aligned it, etc. \$295.

JOHNSON INVADER 2000 AND POWER SUPPLY: VERY Excellent cosmetics, unknown electrical. I had two before this one, ended up trading them, and this one is the prettiest yet. Just don't have any place for it. Johnson rates it for 2000PEP sideband input, 1000W CW input, and 800W AM Linear input, if memory serves correctly. There were only 386 of these units made. Has separate power supply, of course. \$895.

JOHNSON VIKING II: Very good cosmetics, excellent electrical, recently removed from service to make room for a Collins 32V-1. \$195.

JOHNSON VIKING THUNDERBOLT LINEAR AMPLIFIER: Very, very good cosmetics, unknown electrical. Recently acquired in a moment of weakness! Intended to pair up with one of my Rangers, but no place for it now with the Desk Kilowatt living where it does. I am sure it needs new electrolytics. Bought it from a ham who got it from the original owner who said it was working FB when he last used it. Of course, I have heard that before! Has the hard to find 220 connector, but I cut the cord off because it was frayed. \$475.

NATIONAL NC300: Very good to excellent cosmetics. I can't remember if I changed the electrolytics in this one or not. Thought I wanted to collect National's until I found out how hard it was to find some. Gave up about the same time that I ran out of room. \$195.

I'm going to advertise also in Amateur Radio Trader, Electric Radio and QST so look there in case I have forgotten to list some

items.

Pick-up is encouraged, but I will ship if you will pay the actual UPS shipping charges. I will buy the boxes, bubble wrap, peanuts, tape, etc.

You can reach me on packet WB4IJN@N4CII, or Internet wb4ijn@awod.com, or call 803-871-7749. 73, Steve.

From boatanchors@theporch.com Wed Jan 18 17:06:58 1995
Date: Wed, 18 Jan 1995 14:04:55 -0600
Message-Id: <Pine.3.89.9501181446.A13516-0100000@indy2>
From: "Roberta J. Barmore" <rbarmore@indynet.indy.net>
Subject: Re: Bringing up tubes gently

On Tue, 17 Jan 1995 rdkeys@csemail.cropsci.ncsu.edu wrote:

> For sure I was not thinking of the AM BCST rigs that abound on 160.
> Gee, I wonder how well one of those could be made to key CW..... (:+/.).
> NOT....

Well, depending on how willing the owner is to make some modifications, I would be quite confident a Collins 20V1 or 'V3 (never saw a V2!) or the various older RCA equivalents could be made to key very happily. You'd probably be wanting to use grid-block keying, and leave the oscillator going, I'd guess--and not even key the blocking voltage directly, ouch! Some of the lesser makes might not do so well. (And the later PWM AM-BC rigs, no thankee, though I suspect the little Nautel boxes have some seafaring ancestry).

> I know, hows about a Press Wireless rig fer starters.....

[A few other fine examples deleted]

> Actually, such rigs can be quite fine, even the big ol' navy jobs, but
> they are GIGA Boatanchors, [...] Before I go on the final watch, tho,
> I would love to run a QSO on one of those big behemoths.

Giga-BAs indeed! It was fun just running the older BC rigs in their original intended purpose; the oldest I've been on the log for was a 1947 Collins (memory says 10Y but may be wrong), a transmitter without variable capacitors in the final, just shorted-link tuned coils (! there was a shortage). It sounded wonderful and ran like a champ, 866s and the oddball RF & mod tubes and all.

The most forgiving was an RCA BTA-5U2, 5kW standby rig at a station I CE'd; one day when the tower shorted to ground in a storm (bad lighting

transformer, too long a story to tell) and the main rig refused to have anything to do with such a load, the RCA came right up and batted nary a meter. It was an awful thing to do, but the short was sure easy to find! (And fix, with a stack of scrap Plexiglas sheeting). Rather too big to put on the hambands--or in the radio room, since it stood about 20'x7'x4'!

73,
--Bobbi

From boatanchors@theporch.com Wed Jan 18 20:28:42 1995
Date: Wed, 18 Jan 1995 17:46:12 -0600
Message-Id: <9501182315.AA16389@cybernetics.net>
From: ab4el@cybernetics.net (Stephen Modena)
Subject: Durham, NC - 11 Feb - Comm'l Radio Op Lic Exams

Commercial Radio Operator License Examinations:

Durham, NC - - 11 February 95 - - 9:30 a.m.
SW Branch of Durham Public Library: 3605 Shannon Road

Steve Modena AB4EL (919) 787-7618
or Terry Murphy AB4VJ (919) 494-2088

How To Get There:

Talk-in: we will listen for this Durham repeater: 144.85/145.45

These instructions work if you approach South Square Mall
via 15-501 BYPASS.

You are in the vicinity of South Square when you can see the
lone skyscraper with the "needle" tower.

Whether you are coming from I-40, headed north on 15-501 BYPASS...
or coming from I-85, headed south on 15-501 BYPASS, there will be
a sign indicating "Keep Left for 15-501 BUSINESS -- South Square."

Exiting from either direction of 15-501 BYPASS leads to the same spot.

Passing under an overpass, there is a traffic light at a cross road
named "Westgate"...and the Lone Star restaurant is ahead at 2 o'clock.

Go straight ahead.

Midway to the next traffic light, there is a sign: "Next right to
Auto Drive." At the light, there is a big Circuit City store is on

the left...and the only turn possible is to the right, onto Shannon Road.

Turn right at this light.

The first traffic light on Shannon Rd. is at Auto Drive and you are in the midst of South Square mall: continue straight ahead.

The next traffic light on Shannon Rd. is the 3900 block of University Drive: go straight ahead.

After passing the Shannon Manor apartment complex, the next intersection has a stop sign and is called "MLK Jr.": go straight ahead.

Heading up a small hill and reaching the crest just before the curve, you are looking straight at the Durham Library--Southwest Branch... a brick building set on the left side of and below the level of the road.

The exam site address is 3605 Shannon Road.

The exam room is visible through a very large window to the right of the building entrance. Commercial Radio Operator License Examinations

Durham, NC - - 11 February 95 - - 9:30 a.m.
SW Branch of Durham Public Library: 3605 Shannon Road

Walk-ins are welcome, but seating is limited.
For more info or to reserve an exam seat, contact:
Steve Modena (919) 787-7618
or Terry Murphy (919) 494-2088

Licenses Attainable:

Marine Radio Operator Permit - - Element 1
General Radiotelephone Operator - - Elements 1 & 3
GMDSS Radio Maintainer - - Elements 1, 3 & 9
GMDSS Radio Operator - - Elements 1 & 7
Ship Radar Endorsement - - Element 8
3rd Class Radiotelegraph Operator's Certificate--Elements 1, 5, T1 & T2
2nd Class Radiotelegraph Operator's Certificate--Elements 1, 5, 6, T1 & T2
1st Class Radiotelegraph Operator's Certificate--Elements 1, 5, 6, T3 & T4

Who is offering it: W5YI-affiliated NATIONAL RADIO EXAMINERS in N.C.

What will be offered: Examinations on elements 1, 3, 5, 6, 7, 8, 9.
Contact us before hand about Code Elements--credit for elements T1 & T2 is granted to Amateur Extra Class License holders who passed their 20 WPM test.

What to bring:

Two forms of positive personal ID

Your extended ZIP code: xxxxx-XXXX

CASH for the examination fee

Personal check or credit card for FCC fees (if any)

Hand calculator (optional)

Code credit via Extra Class License requires showing original license
and a copy of it

Radiotelegraph license application requires two (2) photos--call us
about requirements

Good preparation and a relaxed mind

WARNING: Anything that even resembles cheating or an attempt to cheat
will be reported *directly* to the FCC, as per regulations

How We Operate:

1. Any or all of the currently offered written elements available may be taken.
2. Elements may be taken in any order
3. The amount of time allowed for the examination session will be reasonable, but not unlimited.
4. We reserve the unequivocal right to limit seating:
first come, first served!
5. If you fail an element, there will no opportunity to retry that element during the same session.
6. Each element passed successfully will be recorded on a
Proof-of-Passing Certificate.
7. If you qualify for a license, you may prepare an FCC Form 756,
or defer until a later time.
8. We will file the license application for you, or you may opt to
file for yourself.
9. We recognise Proof-of-Passing Certificates from other W5YI groups
and from other authorized testing organizations. However, we
will file for a license on your behalf only if at least one of
your needed PPCs was obtained during the current examination
session.
10. Fees charged for the examinations themselves, payable in cash,
follow this NRE rule:

"At this time, NRE requires a fixed \$35 fee from each candidate for the administration of any and all examination elements required for each commercial license per sitting. If any elements are failed, no license which required the failed element would be issued and the applicant would have to schedule another exam session and pay another fee to obtain the desired license."

11. Certain licenses are subject to a FCC Regulatory Fee:

Marine Radio Operator Permit: \$35.00 (5 year term)
General Radio Operator License: no fee (lifetime)
GMDSS Operator (alone): \$35.00 (5 year term)
GMDSS Mainainer (alone): \$35.00 (5 year term)
GMDSS Operator/Maintainer (issued as combo): \$35.00 (5 year term)
Ship Radar Endorsement: no fee (5 year term)
3rd Class Radiotelegraph: \$35.00 (5 year term)
2nd Class Radiotelegraph: \$35.00 (5 year term)
1st Class Radiotelegraph: \$35.00 (5 year term)

12. There are two options for paying any required FCC Regulatory Fee:

- a. Peronal or bank check or money order, payable to the "Federal Communications Commission"
- b. Completion of a FCC Remittance Advice-FCC Form 159 for payment by credit card.

13. We are absolutely obligated to be certain that you are who you say you are--and not a "ringer" standing in for you. Make sure that the identification that you present will pass muster--otherwise you will not be allowed to sit for an examination. If you have any doubt about what will be a suitable combination of ID documents, feel free to telephone us and discuss it.

* * Latest Status on Radiotelegraph Code Examination * *

As per telephone conversation with NRE-W5YI on Friday 07 October 1994, the software for generating the required format and content style is not ready. The FCC is yet to issue the guidelines...the messages (presumably the clear text exams) are to be similar to messages encountered in the service. If the timeliness of taking a code examination is of critical interest to you, call and alert us of your need so that we can contact you about any change in this situation.

--

de Steve Modena NRE Test Center Manager ab4el@Cybernetics.NET

From boatanchors@theporch.com Wed Jan 18 18:30:23 1995

Date: Wed, 18 Jan 1995 13:33:32 -0600
Message-Id: <64383.morgan@speckle.ncsl.nist.gov>
From: "Roy Morgan" <morgan@speckle.ncsl.nist.gov>
Subject: Fil on, Plate off.

>> ... Keeping these cathodes warm, not to the point of seeing any
>> dull red glow, may be satisfactory.
>
>I have not heard of this. Do you have any docs on this from anywhere?
>It may be a general point worth noting.
>

In my ARC-5 reciever, bought in about 1960 for \$9.98 NIB, I had two
ac-dc radio output transformers in series to make up the needed 12 volt
filament supply. They were run all the time. The power transformer is
on a switch. This made for fast warm up of the receiver. I doubt
that the tubes suffered in the way that's been described, because the
original tubes are in there for the most part, and the thing runs FB
today.

The 5963 was a 12AU7-like tube for "use in long off-time
applications": there, the filament is run full on. I'd guess that my
ARC-5 cathodes didn't even glow at all. I'll have to inspect them in
the darkroom - may have to put some glass tubes in cause all but one
tube is metal.

>> In my Heathkit VTVM I have a few thousand ohm resistor

>Now here is a fine piece of boatanchorism that is little known.
>

I have the V-7A: I built it in about 1960. I used to leave it on
continuously to avoid any drift. I figured at a total dissipation of
about 12 watts ... I have replaced some tubes, however. It, too is on
the bench today, turned on when ever I need to see how the needle
swings.

I think maybe I'll short the standby switch on those R-390's.

-- Roy --

Roy Morgan / Tech A-266 / NIST / Gaithersburg MD 20899
(National Institute of Standards and Technology, formerly NBS)
301-975-3254 Fax: 301-948-6213 Internet: morgan@speckle.ncsl.nist.gov

From boatanchors@theporch.com Wed Jan 18 12:15:38 1995
Date: Wed, 18 Jan 1995 09:41:09 -0600
Message-Id: <51671.morgan@speckle.ncsl.nist.gov>
From: "Roy Morgan" <morgan@speckle.ncsl.nist.gov>
Subject: RE: filter chokes

On Tue, 17 Jan 1995 20:00:35 -0600,
Dave Horsfall <dave@esi.com.au> wrote:

>On Tue, 17 Jan 1995 padgett@tccslr.dnet.mmc.com wrote:
>

>> pronounced "Lisi-juice" patterns but do not recall how to spell it
>> (Lisijous ?).
>
>Lissajous.

'Comes from a French word meaning "quiggly".

-- Roy --

Roy Morgan / Tech A-266 / NIST / Gaithersburg MD 20899
(National Institute of Standards and Technology, formerly NBS)
301-975-3254 Fax: 301-948-6213 Internet: morgan@speckle.ncsl.nist.gov

From boatanchors@theporch.com Wed Jan 18 15:36:09 1995
Date: Wed, 18 Jan 1995 12:49:06 -0600
Message-Id: <2F1D8C6B@admin.ClemsonSC.ATTGIS.COM>
From: "Skelton, Tom" <TSkelton@engineer.ClemsonSC.ATTGIS.COM>
Subject: FW: Antenna Question

Hi Doug. Yes, and matter of fact I have communicated fairly frequently with Tom/N4KG on packet about this antenna. He uses one quite successfully on 80 and another on 160. The key is to first find the right tower length including top loading induced by yagis/quads/etc. Let's take an example with my tower. I have a guyed (insulated guy wires) 80 ft 25G tower, with a 2 element 40m yagi fixed southwest at 75 ft and a rotating 3 element 20m yagi at 85 ft. These 2 antennas, plus the 10 feet of spacing between them, probably represent 50 feet of a linear vertical antenna. So, for a 1/4 wave vertical for 80 m I would come down about 17 feet below the 40m yagi (17 feet of tower plus 50 feet of antenna top hat loading) and put my elevated 80m 1/4 wave radials. He uses 4. However, he feels that my tower is too tall for 80 m and would be better as

a 160m tower. I haven't tried either yet. Anyhow, the first parameters are the tower height, top loading caused by the yagis, and the band you want to operate. At the feed point, yes the coax shield goes to the tower. The coax center conductor goes to the 4 1/4 wave radials that are all tied together at the tower. He feeds this with an electrical 1/4 wavelength of 37.5 ohm coax ($300/f(\text{mhz}) * VF$) with 2 pieces of 75 ohm coax in parallel (giving 37.5 ohms). Then, at the end of this he uses a random length to the shack. I can attest that he does fairly well. I don't know what he uses on 160 meters, but on 80 meters he uses a 40 foot tower with a TH6 tribander on top. The 1/4 wave radials are located 10 FEET ABOVE THE GROUND so he only uses 30 feet of the tower as the 'actual vertical transmitting length.' I asked him for a comparison of this, and he said it performed at least as well as the 67 foot vertical and 100 radials he used to erect every fall for 80 meters.

If you want a copy of the article, please send an sase to me and I'll forward it to you. 73, Tom WB4iUX
(Tom Skelton, 105 College Heights Blvd., Clemson, SC 29631)

>From: boatanchors
>To: Multiple recipients of list
>Subject: Antenna Question
>Date: Monday, January 16, 1995 2:19PM

Did anyone read the article in QSY by N4KG about feeding your tower as a pseudo ground plane antenna? I cannot find the issue and wanted to try it. I sort of know what he did. He fed the radial system with the center conductor of the coax and attached the shield of the coax to the tower. My question is how did he determine how far up the tower to put the radials and feed? I'm sure there was some sort of approximation made based on what type (size) of antenna you had on the top.

Doug, N4IJ dsnowden@cdd.harris.com

From boatanchors@theporch.com Wed Jan 18 08:15:01 1995
Date: Wed, 18 Jan 1995 05:44:10 -0600
Message-Id: <Pine.3.87.9501180046.A9855-01000000@steroid.ecst.csuchico.edu>
From: "Chasing the F-2 layer." <kn6al@ecst.csuchico.edu>
Subject: Re: Homebrew Trans!

On Tue, 17 Jan 1995 rdkeys@csemail.cropsci.ncsu.edu wrote:

> >

> > Greetings again, kindelers of the filament!
>
> FB OM DE NA4G/Bob, kindler of '01A's 211s 813s etc.

Greetings all, and tnx fer the *through treatment* of my terse list
o' questions BA Bob; which gives rise to other tangential topics of
discorse. Topic was N9GT's ER 6L6 transmitter:

(deletions in the name of bandwidth {and PPT's HD space})

> > 1.) In the article, Jack said he used a piece of miniductor stock
> > and "experimented with the coil taps for best output"... Well, would some
> > of you veteran brewers o' the bottle pass this knowledge to us newcomers?
>
> If the coil is in a hartley oscillator of any sort, tradition and practice
> generally sets taps as follows:
>
> For triode tubes, tap at about 1/3 up from ground.
>
> For tetrode/pentode tubes, tap at about 1/5 to 1/10 up from ground.
>
> The difference has to do with the gain of the tube.
>

Is what your talking of here Bob, the technique for designing
plug-in "link coupling" type output coils?

> If the coil is in an output circuit, and I am assuming PI net output
> as the usual sort of thing, then again, certain rules of thumb follow:
>
> Taking a coil form of 1 inch in diameter to 1.5 inch in diameter,
> and using no. 16 or no. 14 wire for the coil, about 50-60 turns is good
> for 160 meters, 25-30 turns for 80 meters, 12-15 turns for 40 meters,
> 6-8 turns for 20 meters using tuning capacitances of 250 pf for 160
> meters, 150 pf for 80 meters, 100 pf for 40 meters and 50 pf for 20 meters.

Most excellent. This is the nut of what I was after. So to
cover all of these bands you would tap the single coil at the more-or-less
specific points noted. Which end (final or antenna) would you use to count
off turns from? What abt 30meters? 1/2 way betw. 20 and 40?
P.S; So I *can* go to 20m and still leave it a 2-tub'er? :)

I remember chat from last spring abt "air-dux" (or equiv.) being
available somewhere on the right-coast. Where was that? And might you
or anyone know the part #'s for 1.5" dia. and 1" dia. coil stock suitable
for the pi-net output tank. :)

> All that is really required is that the output capacitance have some 1000pf
> of capacitance in the loading control (actually, unless 160 meters is needed
> one can do nicely with a 365 pf broadcast variable of two sections tied
> in parallel), and the input (plate) tuning capacitance TUNE the coil/cap
> circuit to the frequency desired.

No problem in having too much output (load) capacitance?
If I wanted to include 160m, I could use a 3x 500pf variable, tie all 3
in parallel giving 1500pf. All this would do would make the "peaks"
encountered in loading the higher bands sharper, right??

> >
> > 2.) The RFC to ground at the antenna connector is a bit nebulous
> > as well...
>
> The RFC to ground in any antenna circuit is an automatic short circuit
> for gefusenblowen if the antenna coupling capacitor ever shorts. It
> is generally a good practice on any capacitively coupled output circuit.
> It is not needed for inductively coupled output circuits.

In looking over the N9GT 6L6 ckt, it looks as if he used a .001 disc
cap to couple the 6L6 plate to the tank, Thikning aloud: this is OK on
a pip-squeak rig but would be a larger postage stamp mica on a bigger trans?

If one wanted to "over engineer" this beauty, would you suggest say
a .001uf 1kv mica?

> >
> > 3.) Turning attention to the 6AG7 oscillator stage: I'm wondering
> > how the 15pf and 220pf cap. values hanging from the G1, to cath., to grnd.
> > were calculated??? It would be a simple matter simply to reproduce the
> > ckt. but then I would'nt learn anything!
>
> General rules of thumb again follow the coil taps philosophy of the Hartley
> oscillator when designing Colpitts or Tri-Tet oscillators.
>
> For low gain tubes, tap at about 1/3 up from RF ground using the
capacitive
> divider. For high gain tubes tap at about 1/5 to 1/10 up from RF ground.
> For the 15pf/220pf divider, that is about 1/15 up from RF ground.
> I would consider that a bit light, and opt for a ratio of 20/220 pf.
> But, if it works, don't worry!

I'm not sure how you are coming up with the values, but I trust you!
I have a 1952 handbook... perhaps you can post or recommend a page
reference out of it?

Oh, perhaps he used a 15pf because it is a standard available value,
where as 20pf is not??

> > 4.) How much greater Pwr. supply demand would there be (if any) to
> > substitute a 807 for the 6L6? :-)
>
> 6L6 tubes are rated for about 15 watts in RF service (unless running one
> of Fred Sutters QSL-100 monsters using 6L6's, or inverting the tube into
> a gallon can of transformer oil to dissipate the heat and running 100 watts
> out of said tuffy 6L6..... (:+{}.....).

Amazing! 100w from a single 6L6! A miricle of 1936 technology! :^)

>
> 807 tubes are rated for about 50 watts (can be pushed to 75) in RF
> service.
>
> 807's will work just fine on 6l6 voltages so a substitution is no sweat.
>
> If running the 807 at design tilt of 50-75 watts, then the power supply
> for the 807 should be in the neighborhood of 500-750 volts, whereas
> the normal voltages on the 6l6 should probably not go beyond 350 volts
> (although 450 volts was commonly used it shortens tube life).
>

The pwr. transformer I have (Thordarson T-45556) should give me
abt. 430vdc. So with that it should just loaf along!

ONCE AGAIN...

> > Thats it for now ye' kindelers o' filaments...
> > Best of 73's, and thanks in advance for your sage input!
> > Carl, KN6AL

>
Best 73's to:

> 73/Bob/NA4G
> rdkeys@csemail.cropsci.ncsu.edu

>
> *****

From boatanchors@theporch.com Wed Jan 18 14:03:48 1995
Date: Wed, 18 Jan 1995 09:46:20 -0600
Message-Id: <9501181612.AA121874@csemail.cropsci.ncsu.edu>
From: rdkeys@csemail
Subject: Re: Homebrew Trans!

>
> Greetings all, and tnx fer the *through treatment* of my terse list
> o' questions BA Bob; which gives rise to other tangential topics of

> discourse. Topic was N9GT's ER 6L6 transmitter:

I have not seen that particular rig, but from what you are saying about it it looks like a 6AG7 xtal oscillator with a 6L6 final. FB rig for sure. Somewhere in the bilges I will find that issue..... (:+{f{.....

>

> > If the coil is in a hartley oscillator of any sort, tradition and practice
> > generally sets taps as follows:

> >

> > For triode tubes, tap at about 1/3 up from ground.

> >

> > For tetrode/pentode tubes, tap at about 1/5 to 1/10 up from ground.

> >

> > The difference has to do with the gain of the tube.

> >

>

> Is what your talking of here Bob, the technique for designing
> plug-in "link coupling" type output coils?

I was not sure about whether or not the rig was xtal controlled or an electron coupled oscillator. If it was an electron coupled oscillator then the rules above hold for generic design of the oscillator grid coil. They are usable for almost any tube of the era.

These would not be suitable for link coupling, in particular, because the coupling would be hot above ground in the average interstage, unless shunt feed was used for HV. In that case, you could link couple with a tapped single coil (not exactly link coupling, but in principle the same), taking the next stage grid tap at an appropriate point up from RF ground so that the relative input impedance of the tube was matched. Usually, what I have found is that the grid is tapped at least half way up from RF ground in interstage coupling. For output coupling, if you are trying to match 50 ohms, the tap would be very close to RF ground, maybe 3/4/5/6 turns up from ground on a 25 turn coil, or about 5-10 percent up from RF ground.

>

> > If the coil is in an output circuit, and I am assuming PI net output
> > as the usual sort of thing, then again, certain rules of thumb follow:

> >

> > Taking a coil form of 1 inch in diameter to 1.5 inch in diameter,
> > and using no. 16 or no. 14 wire for the coil, about 50-60 turns is good

> > for 160 meters, 25-30 turns for 80 meters, 12-15 turns for 40 meters,

> > 6-8 turns for 20 meters using tuning capacitances of 250 pf for 160

> > meters, 150 pf for 80 meters, 100 pf for 40 meters and 50 pf for 20 meters.

>

> Most excellent. This is the nut of what I was after. So to

> cover all of these bands you would tap the single coil at the more-or-less
> specific points noted. Which end (final or antenna) would you use to count
> off turns from? What abt 30meters? 1/2 way betw. 20 and 40?
> P.S; So I *can* go to 20m and still leave it a 2-tub'er? :)

I don't use miniductor or similar stock, because it is not ``period enuff'' for me. I do use plain old black irrigation pipe, heavy guage, of 1/1.5/2 inch diameter and hand-wind the coils out of black no. 14 household solid copper wire. That works fine on rigs up to the hundred watt range. A small rig of 15-20 watts or so might do fine with no. 16 or 18 wire. I keep several spools of generic ``yellow'' single strand bell wire about 18 in size for grid coils and small rigs in the 5 watt or less range.

If you were working for all band coverage on a rig using a 6L6 final, and the output was a pi-net, I would just use the no. 18 bell wire, and wind on the coil such that it had a total of maybe 60 turns, then at the 30, 20, 15, 10, 7, and 5 th turns I would bring a small loop out and twist a couple of times to give a tap and then keep on winding. That should give about a rough approximation for the 160/80/40/30/20/15 meter bands on a 1 inch black pvc water pipe coil form about 6 inches long.

Remember the design rule of thumb for resonant circuits:

If you double the frequency, half BOTH the capacitance and inductance of the circuit.

Pick your taps accordingly.

If 160 meters == 60 turns,
80 meters == 30 turns,
40 meters == 15 turns,
20 meters == 7.5 turns,
10 meters == 3.25 turns.

In actual practice, because of stray capacitance and end effects in the coil, the values probably will more closely be:

If 160 meters == 60 turns,
80 meters == 34 turns,
40 meters == 18 turns,
20 meters == 10 turns,
10 meters == 5 turns,

and 30 meters == 14 turns.

As you can see, it is not highly critical, except as you get higher in frequency towards 10 meters, you may have to adjust a turn or two, because of stray capacities in the circuit. So, use these as generic

approximations, and you should be fine.

Regarding the capacitance to use, just start off with 250 pf if 160 is included or 15 pf if 80 meters is the low band, and make sure that you start off tuning from FULLY MESHED towards unmeshed to dip the plate. If any particular band seems to require too little capacitance to tune (like less than 1/4 capacitance or maybe 30-50 pf) then that particular tap may be at too many turns --- back it off a turn or two so that the plate always has about 250 pf for 160 meters, 150 pf for 80 meters 100 pf for 40 meters, 75 pf for 20 meters, 35 or so pf for 10 meters, when the rig is loaded. That will keep you tuned to the right band and not a harmonic, and keep the harmonics down in output.

On a pi-net it really does not matter which end you count the taps from, but I usually just run the least number of turns tapped nearest the plate end of the coil. Use a non-shortening small ceramic tap switch to short out the unused turns to make the tank tune properly. Keep leads relatively short, and it should work fine. Only if you are pushing a KW and have excess stray capacitances and end turn effects will you have problems, and have to make the sizes right and the positioning of the coil or coil sections right, etc.

>
> I remember chat from last spring abt "air-dux" (or equiv.) being
> available somewhere on the right-coast. Where was that? And might you
> or anyone know the part #'s for 1.5" dia. and 1" dia. coil stock suitable
> for the pi-net output tank. :)

I always wind my own coils, but, do have an assortment of odd coils that I have picked up over the years, just in case I might find the right coil pre-wound.

I would not waste my time trying to find minidux/airdux/whatever already wound, unless it just happened to jump off a table towards me at a hamfest. Wind your own, and it works just fine!

>
>
> > All that is really required is that the output capacitance have some 1000pf
> > of capacitance in the loading control (actually, unless 160 meters is needed
> > one can do nicely with a 365 pf broadcast variable of two sections tied
> > in parallel), and the input (plate) tuning capacitance TUNE the coil/cap
> > circuit to the frequency desired.
>
> No problem in having too much output (load) capacitance?
> If I wanted to include 160m, I could use a 3x 500pf variable, tie all 3
> in parallel giving 1500pf. All this would do would make the "peaks"

> encountered in loading the higher bands sharper, right??

It really would not matter much. What you are trying to do is just make sure you have sufficient capacity on the output side of the pi-net to load into 50 ohms and still give you 30db suppression of the second harmonic.

On 160-40 on the big merchant marine rig (which I had to put a pi-net in to get around the original DIRECT capacitive coupling --- ouch!), I use full mesh on a 1000 pf output cap, with no problem. On higher bands it might unmesh to say 500 pf by 15 meters. Basically, you just need sufficient output capacitance to 1) load the 50 ohm or whatever line, and 2) maintain 30 db harmonic suppression --- e.g. keep the bloody mutha fully meshed unless absolutely necessary. Proper pfutzing with the taps will transform the load and maintain 30 db suppression. One can get hairy with the diabolical calculations of Pi and Pi-M or P-L networks, but for the average small rig, the rules of thumb will do essentially as well. As one pushes a KW, the design requires a bit more finesse and exactitude.

>

> > >

> > > 2.) The RFC to ground at the antenna connector is a bit nebulous
> > > as well...

> >

> > The RFC to ground in any antenna circuit is an automatic short circuit
> > for gefusenblowen if the antenna coupling capacitor ever shorts. It
> > is generally a good practice on any capacitively coupled output circuit.
> > It is not needed for inductively coupled output circuits.

>

> In looking over the N9GT 6L6 ckt, it looks as if he used a .001 disc
> cap to couple the 6L6 plate to the tank, Thikning aloud: this is OK on
> a pip-squeak rig but would be a larger postage stamp mica on a bigger trans?

Rules of thumb also apply here --- for CW rigs:

For rigs of 15 watts or less, you can use tv disc ceramics of the 1kv class.

For rigs of 15-100 watts, you can use postage stamp micas of the old style 1-3 kv class. These are the ones about 1/4 inch thick and 1.5x1.5 inch in size.

For rigs of 100-300 watts, you can use the small tub micas (1x2x2 inch sized) of 2000 volt rating.

For KW rigs, you need to use the big tub micas of 3-6 kv rating.

NOTE: if running AM, size up to the next class because of the 2.4x

voltage excursions in AM.

NOTE: modern ceramic doorknob caps can be substituted, but lack class.

> If one wanted to "over engineer" this beauty, would you suggest say
> a .001uf 1kv mica?

As a minimum, I would use a 1kv cap. If I wanted to over-engineer, I would go to the 1-3kv class postage stamp micas (the bigger 1/4 - 3/8 inch sized ones, not the small receiver class ones), for this particular rig. If you intended to use an 807 output tube, then stick to larger postage stamp micas designed for transmitting use or the smaller tub micas, likewise designed for transmitting use. Hint --- Use what is in the junk box!

>
> > >
> > > 3.) Turning attention to the 6AG7 oscillator stage: I'm wondering
> > > how the 15pf and 220pf cap. values hanging from the G1, to cath., to grnd.
> > > were calculated??? It would be a simple matter simply to reproduce the
> > > ckt. but then I wouldn't learn anything!
> >
> > General rules of thumb again follow the coil taps philosophy of the Hartley
> > oscillator when designing Colpitts or Tri-Tet oscillators.
> >
> > For low gain tubes, tap at about 1/3 up from RF ground using the
> > capacitive
> > divider. For high gain tubes tap at about 1/5 to 1/10 up from RF ground.
> > For the 15pf/220pf divider, that is about 1/15 up from RF ground.
> > I would consider that a bit light, and opt for a ratio of 20/220 pf.
> > But, if it works, don't worry!
>
> I'm not sure how you are coming up with the values, but I trust you!
> I have a 1952 handbook... perhaps you can post or recommend a page
> reference out of it?

Rule of thumb number one: Grab what you have out of the junk box!

Anything within 2 x value over rated or over sized will usually work just fine in the way of bypasses or coupling capacitors. The same holds true of inductors like RF chokes. Usually you will never want to size down in value because you may be reaching limits of bypassing or choking capacity of the unit, in the circuit being built. A very common problem along these lines is the insufficient RF choke often found in home brewed amps for 160 meters. Fellas try to use chokes designed for 80-10 meters and wonder why RF goes out the HV lines! Designing a good RF choke for 160-10 meters is no easy trick. It is probably better to design up two rigs, one for 160/80/40/30 use, and a second for 20/15/10 use.

My guess is that he had a 15pf in the junk box, used it and it worked!

I have been reading/building/designing these things for 25 years. During that time, I have spent more time on the john perusing the dusty pages of old books/qst's/manuals, etc, than the xyl would like to have had happen. The gist of the distillation of all of that are my rules of thumb for building boatanchors.

If you want to see particular values, grab the book and look in the beginning chapter on transmitter design. The theory is usually well covered there, and examples are give, with details as to what value parts would be appropriate, etc. Then look at an example of a rig of similar design, later in the book, and compare the values I have suggested with what is in the book. They should be in the approximate ballpark.

>

> Oh, perhaps he used a 15pf because it is a standard available value,
> where as 20pf is not??

Anything from 10pf to 50 pf should work relatively well. If the value strays much from that range, then it may tend to be squirrely and be touchy to key. This is because the feedback tap on the oscillator is determined by the relative values of the two capacitors in the grid circuit to which the cathode is tapped. The values are relatively critical in electron coupled Colpitts oscillators or even straight Colpitts oscillators. In the olden days, much ado was given to get the best values of feedback for stable free running one-tube oscillator stability. In xtal oscillators, the values are much less critical, but need to be within a particular range, to keep chirping/yooping sorts of instability to a minimum. Most instability is due to power supply problems. But, if the power supply is good and stable, then the next thing to check is always the feedback circuit (the capacitors used in the grid-cathode-rf-ground of that 6AG7). After that, check the grid bias value. Usually, that should cure most problems.

So, in the case of the 15 or 20 pf values, it really is not that critical and almost anything in the range of 10-50 pf should work. The design optimum is probably around 25 pf.

>

>

> > 4.) How much greater Pwr. supply demand would there be (if any) to
> > substitute a 807 for the 6L6? :-)

> >

> > 6L6 tubes are rated for about 15 watts in RF service (unless running one
> > of Fred Sutters QSL-100 monsters using 6L6's, or inverting the tube into

> > a gallon can of transformer oil to dissipate the heat and running 100 watts
> > out of said tuffy 6L6..... (:+}}.....).
>
> Amazing! 100w from a single 6L6! A miricle of 1936 technology! :^)

You would be amazed at what folks have done to tuffy 6L6!

> >
> > 807 tubes are rated for about 50 watts (can be pushed to 75) in RF
> > service.
> >
> > 807's will work just fine on 6l6 voltages so a substitution is no sweat.
> >
> > If running the 807 at design tilt of 50-75 watts, then the power supply
> > for the 807 should be in the neighborhood of 500-750 volts, whereas
> > the normal voltages on the 6l6 should probably not go beyond 350 volts
> > (although 450 volts was commonly used it shortens tube life).
> >
> The pwr. transformer I have (Thordarson T-45556) should give me
> abt. 430vdc. So with that it should just loaf along!

With a 430vdc power supply, an 807 would loaf along just fine, as long as the power supply could deliver a good 100-150 mils to the 807. If it is marginal in current capacity, then stick with the 6L6. My guess is that it should work just fine with a xtal oscillator. If the design were changed to an electron coupled 6AG7 oscillator (Colpitts, Clapp, or even my preferred Hartley), the power supply should be capable of handling at least twice the full rated tube load plus bleeder load. If it won't, I guarantee you will have chirp. A VR tube will help to stabilize such an oscillator though, if set up correctly, but is not needed if the power supply is a good one.

>
> ONCE AGAIN...
>
> > > Thats it for now ye' kindelers o' filaments...
> > > Best of 73's, and thanks in advance for your sage input!
> > > Carl, KN6AL
> >
> Best 73's to:
> > 73/Bob/NA4G
> > rdkeys@csemail.cropsci.ncsu.edu

My pleasure.

That is what the BA group is intended for!

73/Bob/NA4G

From boatanchors@theporch.com Wed Jan 18 10:47:39 1995
Date: Wed, 18 Jan 1995 08:24:05 -0600
Message-Id: <01HLZJE2NC9E90NX13@ACAD.FANDM.EDU>
From: CCS_MAH@admin.fandm.edu (Mark Hemlick Ph. D.)
Subject: RE: Homebrew transmitter.

Hi.

I make this post with some trepidation.

Bob's reply to Carl:

>> 807 tubes are rated for about 50 watts (can be pushed to 75) in RF
>> service.
>>
>> 807's will work just fine on 616 voltages so a substitution is no sweat.
>>
>> If running the 807 at design tilt of 50-75 watts, then the power supply
>> for the 807 should be in the neighborhood of 500-750 volts, whereas

RCA's 1938 edition of "Air-cooled Transmitting Tubes" recommends lower power ratings and plate voltages. Maximum ratings for various classes of service are as follows. I assume that these are for intermittent, non-commercial service.

Class	Max. DC Plate E	Power output Watts
B Telephony	600	12.5
C Telephony	475	24
C Telegraphy	600	37.5

73 Mark KA3LFG

From boatanchors@theporch.com Wed Jan 18 14:03:09 1995
Date: Wed, 18 Jan 1995 10:13:57 -0600
Message-Id: <9501181640.AA121931@csemail.cropsci.ncsu.edu>
From: rdkeys@csemail
Subject: RE: Homebrew transmitter.

>
> Hi.
>

> I make this post with some trepidation.

Don't..... no trepidation required.

>

> Bob's reply to Carl:

>

> >> 807 tubes are rated for about 50 watts (can be pushed to 75) in RF

> >> service.

For clarity, I should have said 50-75 watts plate input.....

> >>

> >> 807's will work just fine on 616 voltages so a substitution is no sweat.

> >>

> >> If running the 807 at design tilt of 50-75 watts, then the power supply

> >> for the 807 should be in the neighborhood of 500-750 volts, whereas

>

> RCA's 1938 edition of "Air-cooled Transmitting Tubes" recommends lower

> power ratings and plate voltages. Maximum ratings for various classes of

> service are as follows. I assume that these are for intermittent,

> non-commercial service.

>

> Class Max. DC Plate E Power output Watts

>

> B Telephony 600 12.5

>

> C Telephony 475 24

>

> C Telegraphy 600 37.5

>

> 73 Mark KA3LFG

>

Good points. There are probably CCS values which are rated for continuous class service. I will have to check the book again for clarity. In my book, dating from about 1960 or so, I think there are two columns for continuous and intermittent class service. I will have to double check the values.

In ICAS(?sp) service hams have often used 807's up to 750 volts, quite effectively. I would not go over 750 volts, in any useage, with an 807. Military usage was quite tame (e.g., the TCS used 400 volts on the plates of the 1625's). My RMCA ET-8019A from the commercial maritime shipboard services in a rig designed about 1938, from the folks (RCA) who brought out this fine tube, when these things first came out, uses a voltage divider network from the plate line of up to 1500 vdc to give 750 vdc on

the intermediate stage 807 and about 500 volts on the oscillator stage 807 VFO in intermittent class CW service. In 25 years I have only had one 807 go bad in the beast, and that was just old age, since the filament went weak.

In the average ham rig running 50-75 watts plate input, I would expect 25-40 watts output, which is about what your readings would suggest.

Someone have the 1960s manual handy?

Bob/NA4G

From boatanchors@theporch.com Wed Jan 18 14:47:42 1995
Date: Wed, 18 Jan 1995 11:28:35 -0600
Message-Id: <950118171229_71333.144_DHQ25-4@CompuServe.COM>
From: don merz <71333.144@compuserve.com>
Subject: HRO 60 Caps and ??

My HRO 60 is working just fine....and I'd like to keep it that way. Has anyone on the list done a re-cap job on theirs? Anybody got any particular problems to report? Other gotcha's? I will collect all replies, edit and repost just as though I wrote them myself....er, I mean, with appropriate attribution. Thanks.

From boatanchors@theporch.com Wed Jan 18 08:06:24 1995
Date: Wed, 18 Jan 1995 05:48:57 -0600
Message-Id: <Pine.3.89.9501181107.A7895-0100000@inet.uni-c.dk>
From: MEC <danmec@inet.uni-c.dk>
Subject: HRO-collectors

I have for sale or swop :

AQST. This is the DDR (East-German-Democratic Republic) copy of the HRO. It is in very good condition. With : powersupply/loudspeaker and original coil-container . 8 sets of coils covering 200 kHz to 31 mHz. A truly unique and rare HRO-collectors item.

KST This is the 'Wehrmacht' W.W.2 copy of HRO made by Koerting Radio during the war.. Extremely rare. Comes with power/supply and one coil.

I am looking for WW2 clandestine sets or German military sets.

73 Rag OZ8RO

From boatanchors@theporch.com Wed Jan 18 17:32:36 1995
Date: Wed, 18 Jan 1995 14:22:47 -0600
Message-Id: <3C06A7B0432@s1.xetron.com>
From: "Jack Giehl" <JACKG@s1.xetron.com>
Subject: KWS-1 Restoration

Dear BA enthusiasts,

I am in the process of restoring a KWS-1. The internal cleaning has been completed and I am in the RF alignment stage at this point.

Now to the problem area..... I have apparently normal final grid drive on 80 meters and get about 650 watts out into a Bird 43. But I am having problems with inadequate drive on all of the other bands.

Things I have checked / done:

1. Replaced molded paper capacitors with good quality mylar tubular caps. I noticed an immediate decrease in transmit audio background noise, and much improved ALC operation.
2. The alignment of the slug rack was properly lubricated, moves freely, and returns to the proper position for a given frequency.
3. Performed alignment per manual instructions with expected results except: The 80 meter trap alignment has the variable cap at the trap dip at either max or min capacity(I'll find out tonight), so I will tweak the fixed capacitor in parallel so that the trap variable cap is in range. This should improve the trap performance.
4. I am performing some tube replacements. I swapped several of the 12AT7 tubes around, and got roughly the same results. But when I installed a NOS tube I bought from Antique Electronic Supply in one of the sockets, there was a substantial difference in final drive. I borrowed a tube tester today and will test all of the tubes tonight (except the 4CX250R finals).

If you have experience with this or similar transmitters, I am interested in suggestions. I will post my progress after determining the tube situation tonight.

Thanks all, Jack....

73,

=====

Jack, WB8BFS

jackg@xetron.com

"Peak the grid, dip the plate, and keep the fire in the wire."

=====

From boatanchors@theporch.com Wed Jan 18 15:36:22 1995
Date: Wed, 18 Jan 1995 11:36:51 -0600
Message-Id: <"d09J/f)0000000000*"@MHS>
From: RICHARD_HUMPHREY@HP5200.desk.hp.com
Subject: RE: Power-on surges

A couple days ago, somebody wrote, roughly:
>A light-bulb in series with the line has been traditionally used
>to limit inrush currents, prolonging tube life.

OK, does it? Consider that a cold bulb filament has low resistance, the same as a cold tube heater. The surge through a light bulb does not decrease until several AC cycles have passed and the filament has begun heating up. I think the GE book on triacs shows curves for surge current. Large bulbs act like a short for several cycles!

So here we have a device that starts out with a low resistance which rises with time. This is the opposite of what is desired, right? It would seem to me that a resistor would be a better choice than a light bulb. I'll agree that a bulb is better than nothing, but it may not be worth very much in this application.

Has anyone ever taken any data? Is this yet more ham radio folklore, unsupported by facts? Enquiring minds want to know!

On a related point, I picked up the following bit of design lore somewhere in the distant past. To correctly size a power transformer, add up the current required by the heater string and select a transformer rated for that amperage, and no more. The cold surge drawn by the heater string will cause a correctly sized heater winding to current limit, reducing the strain on the tubes. A heavily over-rated tranny will happily supply that surge and the tubes will suffer. The over-rated tranny may run a little cooler, but who cares? All engineering is a trade-off.

Richard "I have data, and I'm not afraid to use it!"
N6NAE

From boatanchors@theporch.com Wed Jan 18 15:45:46 1995
Date: Wed, 18 Jan 1995 13:16:59 -0600
Message-Id: <9501181910.AA17094@uvs1.orl.mmc.com>
From: padgett@tccslr.dnet.mmc.com (A. Padgett Peterson, P.E. Information Security)
Subject: RE: Power-on surges

>OK, does it? Consider that a cold bulb filament has low resistance,
>the same as a cold tube heater. The surge through a light bulb does
>not decrease until several AC cycles have passed and the filament has
>begun heating up.

Well it takes a few cycles before the transformer starts transforming also (ELI the ICE man) unless of course the filaments are series connected directly to the mains (horrors) in which case it just adds another filament to the chain (not all bad 8*).

In other words, like STP, it won't hurt 8*).

Warmly,
Padgett

From boatanchors@theporch.com Wed Jan 18 18:30:15 1995
Date: Wed, 18 Jan 1995 15:31:13 -0600
Message-Id: <9501182126.AA100423@csemail.cropsci.ncsu.edu>
From: rdkeys@csemail
Subject: RE: Power-on surges

>
> A couple days ago, somebody wrote, roughly:
> >A light-bulb in series with the line has been traditionally used
> >to limit inrush currents, prolonging tube life.

That somebody was me.....

The design concept goes back to the early 1920's in QST's I think.

> OK, does it? Consider that a cold bulb filament has low resistance,

Even a low resistance is in the neighborhood of 10 ohms on a 100 watt bulb and 5 ohms on a 200 watt bulb when cold. My power supply seems to pull up to 10-15 amps kicking on start so my guess is that the addition of 5-10 ohms produces a voltage drop, almost instantaneously, of maybe 25-50 volts which should act as a shock absorber to inrush current as the tube filament load begins to heat up.

> the same as a cold tube heater. The surge through a light bulb does
> not decrease until several AC cycles have passed and the filament has
> begun heating up. I think the GE book on triacs shows curves for
> surge current. Large bulbs act like a short for several cycles!

I would like to see that bit of data if it is available or you could make me a xerox of that page.

I would think not quite as good a short as a direct short, but relatively so.

>
> So here we have a device that starts out with a low resistance which
> rises with time. This is the opposite of what is desired, right?

Not necessarily, see below.

> It would seem to me that a resistor would be a better choice than a
> light bulb. I'll agree that a bulb is better than nothing, but it may
> not be worth very much in this application.

A resistor is a very good choice, but if you work with the cold resistance of a light bulb, that is not such a bad resistor after all, and it does dissipate heat very well.

Also, a light bulb is a hell of a lot cheaper than a 200 watt resistor, except from the junk box or under-the-table boxes of hamfests.

I use lamp loads as series current limiting resistors in battery chargers all the time. It works very well in that mode, and, one can change effective series current limiting resistance by merely changing a lamp.

Going back to the early radio days of the 1920s or earlier, lamps were the standard current limiting resistances, because of their resistance properties. I think one of the early Exide charging panels for spark rigs made good use of lamps in this mode. Look in the first edition of Sterling's Radio Manual or Bucher's Practical Wireless Telegraphy or maybe Loomis' treatise on radio and there may be something on these equipments. The operator was instructed to read the brilliance of the lamp as a visual indicator of charging current.

Granted, all this was for DC, but it should hold similarly for AC at line frequencies. We are talking about the long-term heating of tube filaments over the course of seconds rather than a few 60ths of a second.

In general, lamps make excellent series current limiting resistances in transmitters for various purposes like filament idling, plate and screen bleeder loads and the like. Their main problem is space and the cost of lamp sockets these days. There were several good articles in QST of the 1920's and 1930's about using lamps for various purposes as resistances around ham shacks. I will try to remember to dig through my Homebrew SIG handouts and pull some out for discussion here.

>
> Has anyone ever taken any data? Is this yet more ham radio folklore,
> unsupported by facts? Enquiring minds want to know!

I will try to run a bench setup this evening and see what it can do.

Now you have even me scratching the head and grabbing for the slip-stick. I know it works, but now have to back up de ol' kisser with some white-coat-and-slip-stick-style data.

>

> On a related point, I picked up the following bit of design lore somewhere
> in the distant past. To correctly size a power transformer, add up the
> current required by the heater string and select a transformer rated for
> that amperage, and no more. The cold surge drawn by the heater string
> will cause a correctly sized heater winding to current limit, reducing the
> strain on the tubes. A heavily over-rated tranny will happily supply that
> surge and the tubes will suffer. The over-rated tranny may run a little
> cooler, but who cares? All engineering is a trade-off.

Ham radio boatanchor engineering is always a tradeoff, between what the parts bins have and what the junk box can dredge up. Startups aside, when scrounging in the parts bin, I have always tended to 2x overrate things. Also, when keying oscillators a good load on a power supply is usually required to help keep things stable, especially with early designs. Hence the extra power supply capacity is taken up with a string of bleeder light bulbs or resistors. I guess my design philosophy is not designed around the all-american-5 sort of mentality, but tends to rather conservative Navy/Mercant Marine design which usually is some 2 x overrated from what might be calculated as necessary for at-sea spares consumption. One might compare the 200 watt RMCA ET-8019A design with the Viking II type design and get a good idea of what I mean. One was designed with service in mind, while the other was designed with dollars in mind. We will leave out the hybrids and modern rigs..... (:+}}.....

>

> Richard "I have data, and I'm not afraid to use it!"
> N6NAE
>

What sorts of ways can we hook up a good bench system to check this out? I would think that a good voltmeter on the input and the output of the bulb should register the differential voltage drop through the bulb. As the rig filaments warm up and the load becomes more constant then the differential should lessen until it reaches an asymptote at the load current induced drop through the bulb. For warming up tubes, I would want that drop to be about 20 percent of the rated voltage at the filament socket(s) and when switched out it should go up to full value. For standby mode, I would want that to drop about 5-10 percent of the rated voltage at the filament socket(s) --- I need to check the values in the RCA design books to see what the optimum for idling would be.

A scope could do the same thing, although I don't have a good one available at home.

A strip chart recorder would do the same thing, although it would be delayed by the deadweight swing of the mechanism dampening. Alas, I don't have one at home either.

Any other ideas?

Bob/NA4G

From boatanchors@theporch.com Wed Jan 18 20:15:18 1995
Date: Wed, 18 Jan 1995 17:35:09 -0600
Message-Id: <9501182308.AA00786@texan.frco.com>
From: bill@texan.frco.com (William Hawkins)
Subject: Re: Power-on surges

The same NARC meeting that produced the vacuum forming demonstration (did anybody find that useful?) also had a talk about replacing the resistance line cord (curtain burner) in prewar radios. The heater string worked out to about 50 volts, so there was a wirewound resistor (about 150 ohms?) distributed over the length of the cloth covered line cord. Those cords are (thankfully) hard to find today. The solution? Use a diode! The heaters peak at twice rated voltage, but it seems to be the average that counts. A #47 dial lamp will not survive the startup surge (cold heaters), so it must be in parallel with a resistor that knocks the average down to 3 volts, from 6.

I have no direct experience with this method. What really shook my possible faith in it was a guy in the audience that suggested that a big cap would smooth out the humps - and the presenter thought that might be a good idea! (If you smooth out the humps, you are back to full line voltage again.) But, somebody blew out some pilot lamps and fixed the problem with a small resistor.

Bill Hawkins

From boatanchors@theporch.com Wed Jan 18 09:58:26 1995
Date: Wed, 18 Jan 1995 07:39:03 -0600
Message-Id: <Pine.SUN.3.91.950118071730.8609A-1000000@ncrsun1>
From: Kevin Anderson <anderson@ncrsun1.ncr.usace.army.mil>
Subject: Q's: HW-16 and sidetone/connecting 3-wire power

To BA experts on the HW-16 (others can ignore :-):

My HW-16 still has the original two-wire power cord on it.

I suspect/know I need 3-wire on it. Anybody put such on theirs? One lead to the AC switch, one lead to the circuit breaker on the strip inside -- but which to which? Is it neutral/white/lt-blue to the AC switch and the hot/black/brown to the strip and the circuit breaker?

Where do I connect the ground? To the inside of the GND connection or to just any screw on the chassis?

I'm using the radio on a 3-wire medium gauge extension cord connected to the only plug-in in the basement. Two nights I tried a few CQ's; two mornings after I find the Ground Fault kicked off in the first floor kitchen/bathroom circuit. May be related.

Also, I've tried transmitting a few times with no luck. Don't have my antenna tuner yet to know if I'm putting out anything or have shorts in my antenna. The sidetone gets "buzzy" and raspy sounding. That can't be normal. Receiving seems fine, although I have to periodically wiggle the V3 6EA8 VFO mixer-oscillator tube -- either a flaky tube or poor socket. Ideas?

I'm really a neophyte here, and don't have a local elmer, but want to be careful and learn. Thanks for insights.
Cheers/73. Kevin, KB9IUA

Kevin L. Anderson, CENCR-PD-W, U.S. Army Corps of Engineers
Rock Island District Office, Planning Div.-Waterway Systems
Rock Island, Illinois 61204-2004, USA phone:(309) 794-5586
e-mail: anderson@ncrsun1.ncr.usace.army.mil

Opinions expressed here are my own and do not represent the
U.S. Army Corps of Engineers or the Federal Government.

From boatanchors@theporch.com Wed Jan 18 10:56:22 1995
Date: Wed, 18 Jan 1995 08:26:44 -0600
Message-Id: <199501181426.IAA17248@theporch.theporch.com>
From: bgraham@tecnet1.jcte.jcs.mil
Subject: Re: Q's: HW-16 and sidetone/connecting 3-wire power

Kevin,

I'm not an "HW-16" expert... but I DO have one. My sidetone is also buzzy/raspy and I suspect that is normal (?) since it is a neon bulb relaxation oscillator.

I'm going to put a 3 wire cord on mine and I intend to wire hot to the breaker, ground to one of the strips or other convenient chassis connection. I always like to have the hot breakered or fused, although I THINK mine is wired with one lead going from wall to xformer and the other going from wall to breaker to switch to xformer... will have to double check.

Real expert comments?

Bill

From boatanchors@theporch.com Wed Jan 18 12:53:12 1995
Date: Wed, 18 Jan 1995 09:49:00 -0600
Message-Id: <Pine.3.89.9501181013.A8178-01000000@indy1>
From: "Roberta J. Barmore" <rbarmore@indynet.indy.net>
Subject: Re: Q's: HW-16 and sidetone/connecting 3-wire power

Hi, Kevin!

On Wed, 18 Jan 1995, Kevin Anderson wrote:

> To BA experts on the HW-16 (others can ignore :-):

It's been awhile, but FWIW...

> My HW-16 still has the original two-wire power cord on it.
> I suspect/know I need 3-wire on it. Anybody put such on
> theirs? One lead to the AC switch, one lead to the circuit
> breaker on the strip inside -- but which to which?
> Is it neutral/white/lt-blue to the AC switch and the hot/
> black/brown to the strip and the circuit breaker?

You don't **need** a three-wire cord, **if** you've got the chassis grounded; resistance between your "radio ground" and the ground that (well, one hopes) is a part of the mains distribution of your home should be quite low at 60Hz; and a properly-done RF ground is **much** better than trusting the one that's a part of your house wiring--it can be quite reactive and no ground at all at HF!

That said, I had forgotten Heath had taken the ancient and sloppy route of putting the fuse/breaker and power switch in opposite sides of the primary. As a matter of good practices, it's best to run the hot side of the AC through the protective device, thence to the power switch and on to the transformer primary; the other end of the primary returns to the neutral. However, it usually does not make a great deal of difference.

(Which side of the primary to which side of the line? Unless marked,

either; there is an electrostatic shield in most any decent power transformer and the secondaries thus have good "balance" to ground.)

Still, you can go three-wire if you want to; if there's already a good ground on the set it shouldn't make a lot of difference, if any.

> Where do I connect the ground? To the inside of the GND
> connection or to just any screw on the chassis?

"Good practice" would be the back side of that GND post, yes; in practice, that set is fairly casual about most of the grounding inside, using the handiest lug connected to the chassis in nearly every case; you could do the same.

> I'm using the radio on a 3-wire medium gauge extension cord
> connected to the only plug-in in the basement. Two nights I
> tried a few CQ's; two mornings after I find the Ground Fault kicked
> off in the first floor kitchen/bathroom circuit. May be related.

Most likely, there's some RF schelpping around. However, if your radio's plugged into a circuit downstream of the GFI, it could be something else--I'm kinda wondering about the classic RF-suppression caps put from each side of the line to ground in most tube radios, and how a GFI would feel about 'em; I 'spect GFIs don't like that.

> Also, I've tried transmitting a few times with no luck. Don't
> have my antenna tuner yet to know if I'm putting out anything
> or have shorts in my antenna. The sidetone gets "buzzy" and raspy
> sounding. That can't be normal.

I remember the HW-16 as having that effect--it allowed you to spot your transmit frequency on the receive side. It didn't get *awful,* you just heard the your own sigs detected, mixed in with the sidetone, as you tuned through the transmitted signal on the receiver. ...It usually sounded worse if the VSWR was high, but that's not a sure indication.

(Old-style VWSR bridges, some #30 wire snaked under the braid of a short bit of RG8, plus a microammeter and a handful of parts, aren't hard to make--I can send you some photocopied plans if you don't have one and would like to build one up).

As for antennas, I used a plain old 40m dipole, no balun or transmatch, for several years. It worked well, despite being 7' or less off the ground, actually lower than the floor of the shack! (It was in an area where folks could not wander into it, it's so rude to zap the neighbors y'know).

> Receiving seems fine, although
> I have to periodically wiggle the V3 6EA8 VFO mixer-oscillator
> tube -- either a flaky tube or poor socket. Ideas?

Most probably the socket. Check out the solder joints on the underside of the PC board--tubes and PC boards were not one of the nicer combinations, though the HW-16 did a much better job if it than most. You can still get sockets, if it needs to be replaced.

(I just saw that Bill Graham has commented on this thread--since he's got a working HW-16 right there, his advice will likely be better & more current).

73,
--Bobbi

From boatanchors@theporch.com Wed Jan 18 15:08:32 1995
Date: Wed, 18 Jan 1995 11:40:34 -0600
Message-Id: <199501181738.LAA24082@zoom.bga.com>
From: Henry van Cleef <vancleef@bga.com>
Subject: Q's: HW-16 and sidetone/connecting 3-wire power

As Kevin Anderson said

> To BA experts on the HW-16 (others can ignore :-):
I'm not an HW-16 wizard, but you asked some general questions too.
>
> My HW-16 still has the original two-wire power cord on it.
> I suspect/know I need 3-wire on it. Anybody put such on
> theirs? One lead to the AC switch, one lead to the circuit
> breaker on the strip inside -- but which to which?
> Is it neutral/white/lt-blue to the AC switch and the hot/
> black/brown to the strip and the circuit breaker?
Convention in the "power" world is white=neutral, black="hot", green=earth ground. When rewiring an old device to a 3-wire cord, connect the hot side through a fuse (install one if the device doesn't have one) to the switch, and the neutral (white) to the unswitched return. Connecting it this way will assure that there isn't any "hot AC" floating around beyond the fuse and switch if either are open.

One thing to look for: many old 2-wire setups had the AC line bypassed to chassis ground at the power cord terminals through paper capacitors. I've seen some pretty crazy values here---took 0.25 mfd's out of a Hickock signal generator (which put the chassis at a very low impedance 60 volts). A single 0.01 mfd mylar across the terminals is adequate to bypass RF at 455Khz and above.

>

> Where do I connect the ground? To the inside of the GND
> connection or to just any screw on the chassis?
Connect the green lead to the mechanical frame somewhere. This is
supposed to be a protective circuit to assure that the "consumer" (as
in "no user-serviceable parts inside") can't get a "buzz" from the box
from AC leakage currents inside.

There is an "it says here" in the National Electrical Code about not
connecting the white neutral to earth ground except in the distribution
box (the old ground loop game). On things like AC-DC
"All-American-Five" sets that have one side of the power cord soldered
to the chassis, a polarized 2-wire cord (one blade of the plug wider
than the other) is the thing to use. The wide blade is the neutral
side. Don't tie the neutral and ground together in the set. One thing
to watch out for is miswired 3-wire wall sockets. I have a little
3-led tester (Snapit Cat. 49662) that shows two greens on correct
wiring, and have been amazed at how many times I got one green (no
ground, usually), or the red-green combination show hot-neutral
reversed. I once saw a whole house that had been wired backwards when
it was built.

>

--

Hank van Cleef vancleef@bga.com vancleef@tmn.com

From boatanchors@theporch.com Wed Jan 18 16:51:56 1995
Date: Wed, 18 Jan 1995 13:41:04 -0600
Message-Id: <Pine.3.87.9501181132.A15607-01000000@steroid.ecst.csuchico.edu>
From: "Chasing the F-2 layer." <kn6al@ecst.csuchico.edu>
Subject: Re: Q's: HW-16 and sidetone/connecting 3-wire power

On Wed, 18 Jan 1995, Kevin Anderson wrote:

> To BA experts on the HW-16 (others can ignore :-):

(Deletions...)

> Also, I've tried transmitting a few times with no luck. Don't
> have my antenna tuner yet to know if I'm putting out anything
> or have shorts in my antenna. The sidetone gets "buzzy" and raspy
> sounding. That can't be normal. Receiving seems fine, although
> I have to periodically wiggle the V3 6EA8 VFO mixer-oscillator
> tube -- either a flaky tube or poor socket. Ideas?

>

It is the 9-pin socket. I remember that it was a bit of a problem, but didn't need replacing at the time. Especially compared to the other 2 sockets replaced, that the tubes fell out of when the chassis was turned upside down!

Replace that socket & it will be A-Ok... money back guarantee!

73,

Carl

From boatanchors@theporch.com Wed Jan 18 07:59:21 1995

Date: Wed, 18 Jan 1995 05:38:16 -0600

Message-Id: <2236@sat.ampr.org>

From: ki5sl@sat.n5lyt.ampr.org (Rick_Blank)

Subject: Re: R-388 filter kit

In message <9501171701.AA19569@kali> wallace@jericho.mc.com writes:

>

> Geez, Rick, are you saying you got that filter kit WITH FILTERS for

> a buck?!?!</p>
</div>
<div data-bbox="88 443 104 455" data-label="Text">
<p>></p>
</div>
<div data-bbox="87 457 860 473" data-label="Text">
<p>> Oh well -- keep me in mind if you stumble across another, and I'll certainly</p>
</div>
<div data-bbox="87 475 317 490" data-label="Text">
<p>> pay you more than \$1.</p>
</div>
<div data-bbox="88 493 104 505" data-label="Text">
<p>></p>
</div>
<div data-bbox="87 507 820 523" data-label="Text">
<p>> What's that "Beverages to Oscars" thing -- was that put out by the ARRL?</p>
</div>
<div data-bbox="87 524 602 540" data-label="Text">
<p>> (Speaking of which, where's Jim Kearman nowadays?)</p>
</div>
<div data-bbox="88 543 104 555" data-label="Text">
<p>></p>
</div>
<div data-bbox="87 557 840 573" data-label="Text">
<p>> I got the R-388 when I was graduating H.S. At the time, I was SW DXing on</p>
</div>
<div data-bbox="87 574 811 589" data-label="Text">
<p>> the HRO-50T1. Great receiver ... but I fell in love with readout to the</p>
</div>
<div data-bbox="87 591 828 606" data-label="Text">
<p>> kilocycle! <grin> My 388 had the front panel repainted -- great job, too.</p>
</div>
<div data-bbox="87 607 752 622" data-label="Text">
<p>> The guy hand lettered it and baked it in the oven for the wrinkle</p>
</div>
<div data-bbox="87 625 762 640" data-label="Text">
<p>> finish. I've seen pictures of the grey-panel R-388s but have never</p>
</div>
<div data-bbox="87 641 297 655" data-label="Text">
<p>> seen one in person.</p>
</div>
<div data-bbox="88 658 104 670" data-label="Text">
<p>></p>
</div>
<div data-bbox="88 692 111 702" data-label="Text">
<p>--</p>
</div>
<div data-bbox="87 705 772 736" data-label="Text">
<p>Sorry, but there was no filter in it, oh well, Bill says he has a set
of mechanical filters that are centered on 500khz...</p>
</div>
<div data-bbox="87 754 811 803" data-label="Text">
<p>I saw a grey panel 388 at last summers Hamcom in Dallas and again this
past summer it appeared in Austin at the Summerfest hamfest...I think the
seller was asking \$250 for it non-working....</p>
</div>
<div data-bbox="87 820 260 836" data-label="Text">
<p>Rick Blank, KI5SL</p>
</div>
<div data-bbox="87 837 270 853" data-label="Text">
<p>ki5sl@sat.ampr.org</p>
</div>
<div data-bbox="87 853 251 868" data-label="Text">
<p>2223 Blanco Road</p>
</div>
<div data-bbox="87 869 330 885" data-label="Text">
<p>San Antonio, Texas 78212</p>
</div>
<div data-bbox="87 886 123 901" data-label="Text">
<p>end</p>
</div>

From boatanchors@theporch.com Wed Jan 18 08:06:03 1995
Date: Wed, 18 Jan 1995 05:41:42 -0600
Message-Id: <Pine.SUN.3.91.950117233959.21407B-100000@access1.digex.net>
From: Tony Stalls <rstalls@access1.digex.net>
Subject: R-390A Rectifiers

I received a list of instructions from Rick Mish on the care and feeding of my newly restored R-390A. Since someone commented similarly concerning not converting R-390A rectifiers, I thought I'd share this part of Rick's advice ("<>" brackets mean Rick underlined) quoted absolutely verbatim:

^^^^^^^^^^

"<do not> remove tube rectifiers and replace with diodes, this is the most damaging modification you can do to this radio, more damage <has been done> with this mod than any other. when done properly it is excellent, I have yet to see it done properly. you crank the high voltage up <to high> and when you go directly to "AGC" or "ON" you are putting this higher voltage on <cold> tubes. by not giving the tubes time to warm up you shorten tube life by 50% ! and you are running power supply filter capacitors and audio tubes at their maximum limit risking blowing them up. <leave tube rectifiers in !>"

Rick also noted to not leave the R-390A in standby for more than an hour which was mentioned in BA also except the advice I recall from here was to limit standby to a half-hour.

73,

Tony
K4KY0

From boatanchors@theporch.com Wed Jan 18 23:33:27 1995
Date: Wed, 18 Jan 1995 21:01:56 -0600
Message-Id: <9501190301.AA03260@kahuna.math.hawaii.edu>
From: jeffrey@math.hawaii.edu (Jeffrey Herman)
Subject: rec.radio.swap

>From: jeffrey@math.hawaii.edu (Jeffrey Herman)
Still looking for one of those 70's era 2-3 MHz AM marine transceivers (they became illegal to use after '76 or so). Manufactured by Pearce-Simpson (and others). These are effortless to convert to 160M. Jeff NH6IL

>From: judd@koa.ifa.hawaii.edu (David Judd)
Posted for a friend: For Sale: Collins 75S3 ham rcvr.
(think that it is round-emblem type). Clean, works good.
\$300/offer plus shipping. Call John KH6XS at (808) 874-8411 or
email me. David NH6H

>From: rz5630@waccvm.corp.mot.com
I am looking for the Swan models 600-T and 600-R/Custom, transmitter and
receiver combination. If you have or know of anyone who has these pieces of
equipment for sale, I would like to hear from you. Price will be determined
strictly by the mechanical and electrical condition of the units. I will pay
all shipping charges to Arizona. Please EMAIL or call with your particulars.
Bob Norman, ARS K7NWB

>From: tswc@aol.com (Tom Estes)(TSWC)
Need a service manual for Hammarlund sp 600 photo copies ok. Tom

>From: MNNK81A@prodigy.com (Walt Turansky) N7QFM
SB-100 Transceiver, 10-80m
HP-23 Power Supply for above
SB-630 Station Console, phone patch, clock, swr
Manuals for all the above
Take it all for \$150 plus shipping. Walt_Turansky@ccm.ch.intel.com

From boatanchors@theporch.com Wed Jan 18 15:54:49 1995
Date: Wed, 18 Jan 1995 13:10:50 -0600
Message-Id: <Pine.3.89.9501181330.A13222-01000000@indy2>
From: "Roberta J. Barmore" <rbarmore@indynet.indy.net>
Subject: Re: T-pad network for the Ranger

I see that someone spoke in re this, to the effect that "it wasn't
hard to figure out in your head," or words to that effect, but no-one
seems to have run the numbers.

This sort of thing can be treated as if it were simple DC analysis,
taken apart into bits, and figured out step-by-step, which is the only
way I know how to do it.

So, as an example for those who may not be familiar with doing this,
I'm gonna, and Lord save me from doing any real howlers in the process.
"R" is used in place of capital omega (doesn't seem to be one on this
keyboard, geegolly) and mathematical statements follow the typographical
conventions of the programming language BASIC.

First, draw the network, including the load (considered here as a
simple 50 Ohm resistance--it probably isn't, but close enough). The

original 6-dB, 50 Ohm T-pad consists of a 16.7R resistor in series with the source, shunted to ground at the far end by a 67R resistor; from the junction of the two, another 16.7R resistor runs to the 50R load, and the far end of the load goes to ground.

This resolves into a 16.7R in series with two paralleled 67R, and then to a 16.7R in series with a 33.5R; add 'em up, and lo, it's just about 50R.

We have 35W into it. To get to some handier numbers, the voltage across the load is the square root of the product of power & resistance, about 42V, and the current is 0.84A. (Better check-- $42 \times .84 = 35.3$, close enough).

Now then, we step back to the 16.7R in series with 33.5R model; .84A through 16.7R drops 14V ($E = I \times R$), .84A through 33.5R drops 28V. $14V \times 0.84A$ gives us 11.8W to be dissipated in the input 16.7R resistor.

Moving on and looking from the center of the T-pad, we have 28V across a pair of 67R resistances in parallel. We know there's .84A of current, and since the resistances are equal, it splits evenly and each gets .42A. $28 \times 0.42 = 11.8W$, and that's the power warming up the 66.7R resistor to ground in the middle of the pad.

The other (output) leg is actually 16.7R in series with 50R. .42A through 16.7R drops 7 volts; 7×0.42 gives 2.9W of heat there. (Or you can do $I^2 \times R$, $0.18 \times 16.7 = 3$, close enough).

H'mm, better check--the load's got $28 - 7 = 21V$ across it, at .42A; 21×0.42 is 8.82W. If it's a 6dB pad, the output power is a quarter of the input: $8.82 \times 4 = 35.3$, we started with 35W in, and that's close enough for my slide rule on a Wednesday afternoon about quitting time.

That's simple analysis--reduce the circuit to its simplest form, calculate the voltage and current; then step back up through each level of complexity, moving from input to output as you go, applying concatenated Ohm's and Power laws to see what's what. It's a good idea to work things a couple of different ways, and see if what you end up with tallies with what it should be. For me, this is often a pencil and paper task--I lose my place otherwise. :)

As a matter of good practice and caution, I tend to double up the calculated power ratings when buying the resistors--the bigger ones have more radiating surface and you can be a bit more casual about things like air flow around them that way.

73,

--Bobbi

From boatanchors@theporch.com Wed Jan 18 18:51:26 1995

Date: Wed, 18 Jan 1995 15:09:01 -0600

Message-Id: <9501182034.AA10681@cen.com>

From: gc@fox.gsfc.nasa.gov (Gary Chatters)

Subject: Re: T-pad network for the Ranger

Bobbi writes:

>
> I see that someone spoke in re this, to the effect that "it wasn't
>hard to figure out in your head," or words to that effect, but no-one
>seems to have run the numbers.
>

I did say something like that. :-)

This one is easy enough to leave as an exercise to the novice
or technician. (And if your basic ham radio class didn't tell
you about series and parallel resistance, go ahead and ask).

What are new hams learning these days?

[...]
> First, draw the network, including the load (considered here as a
>simple 50 Ohm resistance--it probably isn't, but close enough). The
>original 6-dB, 50 Ohm T-pad consists of a 16.7R resistor in series with
>the source, shunted to ground at the far end by a 67R resistor; from the
>junction of the two, another 16.7R resistor runs to the 50R load, and the
>far end of the load goes to ground.
> This resolves into a 16.7R in series with two paralleled 67R, and then
>to a 16.7R in series with a 33.5R; add 'em up, and lo, it's just about 50R.

At this point I didn't bother figuring current and voltage, but
just figured the fraction of total power dissipation in each branch
of the circuit. That's how I could keep the figures in my head.
Numbers like 0.84 are too messy :-).

It helps to recognize that 16.7 was probably computed as 16.6666666...
and rounded off.

The final result being that R1 and R3 will each dissipate
1/3 of the total power. For 40W total that's $40/3 = 13.3\text{W}$.
A bit more than 10W, but not much.

Gary

From boatanchors@theporch.com Wed Jan 18 15:37:41 1995
Date: Wed, 18 Jan 1995 13:02:43 -0600
Message-Id: <01HLZR1Z1GGY8YR2NJ@RANDB.PPRD.Abbott.Com>
From: KANAMAA%AMGATE%MATRXA@randb.abbott.com
Subject: test msg

>From: Kana, Michael (D9CY)

Date: Wed, Jan 18, 1995 1:01 PM
Subject: test msg
To: bigboats
testing... please pardon the bw
73's de AA9IL

From boatanchors@theporch.com Wed Jan 18 10:04:47 1995
Date: Wed, 18 Jan 1995 07:42:09 -0600
Message-Id: <9501180737.aa14956@jackatak.theporch.com>
From: listtown@jackatak.theporch.com (List Admin/Owner BoatAnchor Mail List)
Subject: The slide towards overquoting

Hello Gang-

Please accept my apologies for this post, but there is a difficult trend appearing lately that needs some addressing:

When responding to a message on the list, and posting a response back to the list, please be considerate of everyone and **edit** the quoted message. The documentation for the change-over to "ThePorch.COM" and the subsequent welcome message sent to everyone asked, more gently than this, that everyone please take the time to include only those portions of a previous message necessary to establish the context of your addition.

Good "Netiquette" requires careful editing lest the good comments made become lost in the sea of messages we have already read.

As we have been more accessible and more people have joined in, the volume has increased, and for the most part, I couldn't be happier. However, the host system, theporch.com is now handling about 100,000,000 bytes of mail traffic each day, through a 28.8K modem-to-modem SLIP connection. There are plans to upgrade the link, but that isn't really the point. I will gladly support volumes like this **IF** the posts are adding something other than a total re-post of someone else's message.

Please, everyone, edit the previous posts down to what is necessary to maintain the thread.

Thank you all.

--

73

Jack, W4PPT/Mobile (75M SSB 2-letter WAS #1657/#1789 -- both all mobile! ;^)

* - - - BoatAnchor Mailing List Owner - - - *			
Jack GF Hill	Voice: (615) 459-2636	Ham Call: W4PPT	
* P. O. Box 1685	Modem: (615) 377-5980	Bicycling and SCUBA Diving	*
Brentwood, TN 37024	Fax: (615) 459-0038	Life Member - ARRL	

* listown@jackatak.theporch.com-"Plus ca change, plus c'est la meme chose" *

From boatanchors@theporch.com Wed Jan 18 07:58:24 1995
Date: Wed, 18 Jan 1995 05:46:33 -0600
Message-Id: <Pine.3.87.9501180138.A9855-0100000@steroid.ecst.csuchico.edu>
From: "Chasing the F-2 layer." <kn6al@ecst.csuchico.edu>
Subject: Thordarson xfmr. info. pse. :)

Greetings iron lovers,

If anyone has spec. data on Thordarson power transformers
could I please get info on the type T-45556 ?

Specifically, I need the current rating on the 430v - 0v - 430v
winding. But a rundown on all the winding specs. would be appreciated!

Tnx gang and 73's!
Carl, KN6AL

From boatanchors@theporch.com Wed Jan 18 17:20:48 1995
Date: Wed, 18 Jan 1995 14:15:48 -0600
Message-Id: <199501182015.PAA00394@altair.cs.unc.edu>
From: Nick England <nick@cs.unc.edu>
Subject: Vintage Gear Wanted

Want to buy or trade for the following -

Heath

GR-54 SWL rcvr
XC-6 6m converter for Mohawk rcvr
VX-1 VOX
CA-1 Conelrad Alert

Knight

T-400 transmitter (if any exist!)

EICO

711 "Space Ranger" rcvr

EF Johnson

Mobile VFO

Viking 500 xmtr (I can hope can't I)

National

speaker for NC-300 (smooth finish)

Hallicrafters

SX-112

SX-115

Any unbuilt (or unfinished) tube-type ham radio kits

Nick England KD4CPL

nick@cs.unc.edu

(h) 919/929-4342

From boatanchors@theporch.com Wed Jan 18 14:15:46 1995

Date: Wed, 18 Jan 1995 10:40:08 -0600

Message-Id: <9501181706.AA122034@csemail.cropsci.ncsu.edu>

From: rdkeys@csemail

Subject: Re: your mail

> To the point, now. Indirectly heated cathodes, coated with appropriate
> low-work-function metals, were found to develop increasing resistances
> between the nickle cathode cylinder and the emissive surface if left hot
> with no current flowing. This showed up in certain applications in WW II
> where the equipment was left with heaters on and plate circuits off. It was
> ordinarily referred to as "sleeping sickness" and was cured by replacing
> the tube. Keeping these cathodes warm, not to the point of seeing any
> dull red glow, may be satisfactory.

I have not heard of this. Do you have any docs on this from anywhere?

It may be a general point worth noting.

> In my Heathkit VTVM I have a few thousand ohm resistor across the off-on
> switch to keep the innards warm and dry. I lived in Florida when I built
> this one. No mildew has developed on the circuit board and it still
> operates fine with the original tubes.

Now here is a fine piece of boatanchordom that is little known.

>From what I can gather, it was used all the time in commercial
marine radios to keep the innards warm and dry. All of the
marine gear that I have seen have a dropping resistance in the
filament circuit that is always on, and rated at some 5-10 watts or

I had seen this happen at industrial applications. We used a 200 w exciter to flash the 'getter' metal in our rebuilt picture tubes. The plate HV was applied for a few seconds when the neck of the pix tube was in the RF yolk. Most of the time the exciter RF amp sat idle on hot filaments.

When we noticed that it took us a few tries to "flash" the pix tube, we tested and usually replaced the finals. (Either 'shorted' or an occasional 'leaky' final tube.)

Saw the same type of problem in industrial RF machines used in heat sealing of plastic notebook binders, book covers, and page protectors.

Some of the trouble comes from out gassing of the cathode/filament materials into the tube vacuum, and some is poisoning caused by the metal transferred from one tube element to the next tube element. The filament/cathode area has a small cloud of particles that are boiled off the surfaces. These particles are static until a more positive grid voltage is applied, and some of the drawn off to the grid. This happens at a greater rate with the higher screen/plate voltages.

All that rapid heating and cooling also causes flaking of the filament and cathode surfaces. I have seen fair size metal flakes inside old tubes that tested as shorted. Have also seen these flakes cause some nasty flashing in bad high power tubes!

73,

John Rymell N3PFF